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1. Title of the Invention: Air sterilization and purification apparatus  
2. Inventor: Kiyoshi ANZAI  
    Domicile: 1070-2 Kataoka, Hiratsuka-shi, Kanagawa-ken  
3. Applicant: Director: Kiyoshi ANZAI  
    Domicile: Kyowa Seiko, Ltd.  
4. Agent: 1070-2 Kataoka, Hiratsuka-shi, Kanagawa-ken  
    Domicile: Hiraku MIURA (4002) Patent Attorney [seal]  
5. List of Appended Documents Marukin Building, Kagurazaka, Shinjuku-ku Tokyo 162  
(1) Specification 1 set  
(2) Drawings 1 set  
(3) Duplicate Copy of Application 1 set  
(4) Power of Attorney 1 set Method Examination  
(5) Request for Examination 1 set

[illegible stamp]

Specification

1. Name of the Invention: Air Sterilization and Purification Apparatus

2. Scope of Patent Claims

In an air purification apparatus that passes positively charged airborne dust between opposing electrodes, an air sterilization and purification apparatus wherein air is caused to pass through while inducing a separation phenomenon by switching the direction of flow of air that passes through the aforementioned opposing electrodes and modifying a cross section of the passage.

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### 3. Detailed Description of the Invention

The invention of the present application is one that relates to an air sterilization and purification apparatus, and in a purification device that causes airborne dust particles to be absorbed by static electricity, relates to a device capable of raising dust removal effectiveness, and is intended to achieve an air sterilization and purification apparatus that, in particular, is made up of a combination of novel and ever simpler elements, is manufactured by a simple process with lower costs of production, and that, with excellent safety, is capable of achieving even better results in use.

Along with the development of heavy industry, air pollution from sources at each stage of the production process, nitrous oxide and sulfur dioxide emitted from transportation sources, and heavy metal particulates, have steadily increased. The widespread expansion of pollution has become an issue of serious concern to society, and various regulations have been proposed to prevent pollution, including preventing the generation of toxic materials as well as the strengthening of emissions standards. These approaches, however, cannot be considered adequate, and there are a growing number of people who suffer from lung cancer and other cancers as well as an increase in the number of people suffering from asthma. Air purifiers have become a common and indispensable part of life and are to be found installed in homes and sickrooms to prevent and/or treat these illnesses, and are used as prevention or treatment devices in the production stages of sanitary pharmaceuticals, foods, devices, and are also employed in the production of precision machinery.

A variety of devices have been suggested to cleanse the air by removing airborne toxic materials. Among those are air purifiers that use filter materials in air flow passageways to physically collect the dust, or electrical air purification devices such as dust removers that make use of static electricity or infrared rays to disinfect the air, or a combination of any of these approaches in order to remove toxic materials.

Among these, suggestions for conventional devices based on the aforementioned use of static electricity are known, including, for example, (a) an approach utilizing centrifugal force designed such that air, induced from an air inlet, passes through an ionization element while electrical voltage is applied to the inner and outer cylinders while the inner cylinder rotates, moving the air between the inner and outer cylinders, and (b) an approach where, in the above configuration, the outer circumference of an inner cylinder has inclined guide vanes provided in the axial direction along the outer circumference of the inner cylinder and rotational movement is applied to the air as it passes through between the inner and outer cylinders to make use of centrifugal force.

The above mentioned approaches have attempted combined dust collection by the use of electrostatic migration and centrifugal force, however, because high voltages with 11 KV in between the inner and outer cylinders, and as a result of rotating the induced air, a rectified electricity may be generated due to frictional resistance depending upon the air flow rate, and electric discharge sparks may occur between the dust particles that have collected onto the external cylinder, frequently causing risk of electrocution as well as the increased production of ozone and possible malfunction of the device.

In view of the above, research conducted by the inventors of the present application have overcome and eliminated the well known defects described above, and have perfected a device that is superior in terms of safety and that markedly increases the efficiency with which dust is adsorbed. The invention comprises a fan motor; an inner cylindrical electrode that has a

built-in high-voltage transformer, and that is connected to the positive side; a high voltage cap connected to the negative side; an external cylindrical electrode that is earthed; and a housing that has openings on both sides, and that is supported by a pedestal. On occasion that airborne dust that is guided into the unit through the upper inlet passes through an ionization section high-voltage cap that is connected on the negative side, a positive charge is applied to the dust, and it is guided into the electrostatic field between the grounded outer cylindrical electrode and the positive inner cylindrical electrode, and as a result of the electrostatic induction effect, airborne dust passing through is adsorbed onto the surface of the outer cylindrical electrode. Thus, the present invention is characterized by having opposing electrodes that have a plurality of parallel curved surfaces and a plurality of convex curved surfaces or recessed curved surfaces on the inner cylinder and an outer cylinder provided with a plurality of parallel curved surfaces and a plurality of convex curved surfaces or recessed surfaces, wherein the convex curved surfaces or recessed surfaces of the inner cylinder and the convex surfaces or recessed surfaces of the outer cylinder alternate with each other. By creating an electrostatic field between these opposing cylinders, the direction of the flow of air passing through them can be alternated, and the flow passageway cross section can be altered so that the flow rate fluctuates, thereby creating a flow separation phenomenon. This causes the generation of a stagnant flow, a reverse flow, or a turbulent flow of air that contains dust. The intention here is to extend the duration of the effect of the electrostatic adsorption on the outer cylindrical electrode surface and to increase in the efficiency of dust removal. The next object of this invention is to provide a device with superior safety. Additionally, an object of the invention is to provide a simple and compact mechanism that can be made available at low cost and that can be placed easily in a variety of locations, as well as to provide a device that allows simple, easy, and safe cleaning of the panel upon which the dust has been adsorbed. Other objects and characteristics of the present invention can be understood from the following explanation.

In Figs. 1 through 5, a housing acceptor cylinder (5) is supported on a stand (1) by means of a shaft (2) upon which a support board (4) consisting of insulating material and provided with exhaust windows (3); an external cylinder accepting cylinder (7) is mounted on the edge of the lower opening section of said housing; an exhaust windows (6) is arranged in the external cylinder barrel (7); and a fan motor (8) is internally installed in a motor cap (9). The fan motor (8) (for practical purposes, preferably with a maximum torque of  $1040 \pm 10\%$ ) is connected to a power source, and the motor cap (9) has a built-in high-voltage transformer (11) that is connected to a power source. An inner tube electrode (14) made of metal and provided with stepwise alternating vertical curved surfaces (12) and convex curved surfaces (13) is installed onto the positive side of the high-voltage transformer, and a rounded-head inner cap (16) made of insulating material and continuing the multiple outer cylinder support [illegible] (15), (15) is mounted in the top opening of this inner cylindrical electrode (14). A metallic high voltage cap (18) that is provided with a limit switch (17) is installed in this cap (16) and connected to the negative side of the high-voltage transformer and a metallic outer cylindrical electrode (22) provided with stepwise alternating vertical curved surfaces (20) and recessed curved surfaces (21) on the upper opening edge step section (19) of the outer cylinder acceptor (7). The vertical arced surfaces (20) and the recessed arced surfaces (21) are positioned so as to face the swelling arced surfaces (12) on the inner cylindrical electrode (14) and the vertical arced surfaces (12) on the inner cylindrical electrode (14) with each other, respectively. The external cylindrical electrode (22) faces the inner cylindrical electrode (14). According to FIG. 1, an air inlet window (23) is arranged in the upper opening of the external cylindrical electrode (22), and a retainer plate (25) made of insulating material is provided on the bottom limit switch retainer element (24). Next,

the housing (27) is installed on the upper opening of the outer perimeter section (26) of the housing acceptor cylinder (5), which is installed on the support board (4). A head section retaining cylinder (28) is installed at the top section of this opening, and an air inlet window (29) is provided in this upper opening and a connector board (31) made of insulating material and provided with dust-proof mesh/screen (30) that is connected by means of bolts (32) to the retainer plate (25), air inlet windows (29), and air inlet windows (23), and is configured so that air passes between the inner and outer electrodes, the exhaust windows (6), and the exhaust windows (3), and is circulated to the outside when the fan motor (8) is operating.

At this time, when the high voltage transformer (11) and power source are connected by a switch, which is separately arranged (in practical terms, an input voltage of 100 V AC and output voltage of 7 KV DC are preferable) the airborne dust that is introduced [into the unit] is positively charged in the vicinity of the transformer (11), by the inner cylindrical electrode (14) that has been connected to the positive side by means of the electrostatic induction between the inner and outer electrodes, and is migrated to the external cylindrical electrodes (22) and clung to its walls.

Here, the direction of the air flow that is passing through the convex curved surfaces (12) and vertical curved surfaces (13) provided on the inner cylindrical electrode (14) is switched by the vertical curved surfaces (20) and recessed curved surfaces (21) provided on the outer cylindrical electrodes (22), and as a result of the change in the cross section layer between these electrodes, the spacing between the vertical curved surfaces (12), (20) of both electrodes should be approximately 20 mm; the spacing between the vertical curved surfaces (21) on the outer cylindrical electrodes (22) and the convex surfaces (13) on the inner cylindrical electrodes (14) should be approximately 16 mm; and the spacing between the recessed curved surfaces (21) on the outer cylindrical electrodes (22) and the vertical curved surfaces (12) on the inner cylindrical electrode (14) should be approximately 25 mm, for practical purposes. The recessed curved surfaces (21) should be 5 mm in diameter, while the convex curved surfaces (13) should be 4 mm in diameter. There is a change in flow rate, and the separation phenomenon is augmented. As a result, the dust-bearing air flow stagnates, reverses or becomes turbulent, thereby extending the duration for electrostatic adsorption and increasing dust collection efficiency (Fig. 6).

In the cross sectional configuration of the above mentioned both electrodes described above, in another embodiment, the convex curved surfaces (13) of the inner cylindrical electrodes (14) could have a gentle linear flow [illegible] convex curved surfaces (13) on the upstream side to intensify the switching of the direction of flow and the change in the flow passageway cross section, making it that much easier for the separation phenomenon to occur, forming lead (33) between the convex curved surfaces (13), (13) for a configuration that augments electrostatic induction. (Fig. 7)

Moreover, as a separate embodiment, convex curved surfaces (34) with gentle flow lines are formed on the upstream side of the outer cylindrical electrodes (22), and both flow line convex curved surfaces (34) and flow line convex curved surfaces (35) are positioned so they oppose one another, thereby intensifying the switching of the direction of flow and the change in the flow passageway cross section, extending the duration in which adsorption occurs due to stagnation, reverse flow, and turbulent flow of the dust-containing air (Fig. 8).

With regard to removal of dust clung onto the surfaces of the outer cylindrical electrodes, the power to electrode (22) is removed along with the retainer plate (25) by removing the connector board (31) and by pulling up and removing the head section retaining cylinder (28) and the housing (27), and after cleaning these, it is easy to restore them to their original state and join together. At this time, the retainer element (24) of the retainer plate (25) is separated from the limit switch

(17), thereby breaking off the flow of current between the high-voltage transformer (11) and the power source, so that there is no risk of electrocution.

As configured above, the present invention extends the duration of the cling effect on the outer cylindrical electrode by means of electrostatic induction of the dust-carrying air that passes between the electrodes, thereby increasing the efficiency of dust removal and reducing mold spores and yeast fungus.

Moreover, this is a particularly safe device since there is no danger that frictional force and resulting rectified electricity will be generated as a result of centrifugal force as the air passes through the unit, and the risk of malfunction due to sparking electric discharge between the adsorbed dust particles resulting in electrocution or explosion can be prevented, and the generation of ozone can be suppressed.

Also, given the device's simple and compact configuration, it can be manufactured less expensively, and it is also easy to move.

#### 4. Brief Description of the Drawings

Figure 1 is a front view. Figure 2 is a plan view. Figure 3 is a view of the bottom surface. Figure 4 is a cross-sectional view along the A-A line in Figure 1. Figure 5 is a cross-sectional view along the B-B line in Figure 1. Figure 6 is an enlarged view of the area indicated by the letter E in Figure 4. Figure 7 is an enlarged flow line cross section diagram of another embodiment. Figure 8 is an enlarged flow line cross section diagram of yet another embodiment.

Applicant: Kyowa Seiko, Ltd.

Agent: Hiraki MIURA [seal]

## 特許願

特許廳長官 年之六月五日  
 1. 発明の名前 互換式電源装置  
 2. 類別番号 甲第 16080  
 3. 特許申請人 住 所 本店 東京都千代田区麹町二丁目四番地  
 4. 代理人 住 所 本店 東京都千代田区麹町二丁目四番地  
 5. 登録料金の目録  
 (1) 明細書 1通  
 (2) 図面 1通  
 (3) 説明書 1通  
 (4) 動作状 1通  
 6. 署名  
 7. 50 016080

②日本特許庁  
公開特許公報

①特開昭 51-9007A  
 ②公開日 昭51(1976)8.6  
 ③特許番号 50-16080  
 ④出願日 昭50(1975)2.6  
 審査請求 有 (全5頁)  
 厅内整理番号  
 7003 61

## ⑤日本分類

72 C44

⑥IPC/CN  
B03C 1/00明細書  
1. 発明の名前 互換式電源装置  
2. 特許請求の範囲

この発明は、互換式電源装置の点に亘り、特に子供用車両を運転させるようにした互換式電源装置について、主電力用する電池箱を通過する電流が過剰な場合は過剰電力を吸収する、本口電流や瞬間電力を吸収せることによつて、制御装置で吸収せながら空気を送り出しある以上にしたことを特徴とする互換式電源装置である。

## 3. 発明の詳細な説明

本発明の構成は、空気吸引部と風扇に由り、空気中のふんじんを吸引部により吸引せしめる構造において、その吸引部取付けることとのできる構造に由り、とくに化粧板で一周堅封を施すの部分からなり。両端を工具により他の電源装置と並んで接続され、かつ穴を抜いて後、工具により使用部を構成などとのてある充電式電源装置を併用するものである。

本電源装置の構成に於て、各部の構成に於て

て示されたる大まかに構成の一例を記載するに於て、明細書の記載内容とくわざ子供の安全衛生の実現度の優先度を考慮して記載した。本発明は、子供の安全衛生を第一とし、またもして子供の安全とより社会的問題を解決させて大きく取り上げられており、又その実現度についても結構な実現度を有し、有効利用の実現の子供の安全とが併存する點が特徴である。本大がセイ子供とはいえず、又児童に至る程度のその他の子供は安全でなく危険な構造の実現である。本実現度は、上記開示の子供上又は幼児上装置門に該当し或いは開室に該当し、子供、幼児装置として或いは又開室上装置、工具、工具等の操作装置においてともに、若者装置の開室改修にかかって手を立し、身体上不適の原因となつた。

セミヤ、エスヤの空気吸引部を専らして子供のための開室が開き実現され、セミヤ、エスヤの吸引部に於ける構成において特徴は、空気吸引部を用いた構成に該当するもの及び空気吸引部により吸引部を設けしめるもの又は吸引部を用いた構成を用ひて吸引部を設けたが、本実現度の子供の開室その他の構成の構

合せお母さんよつて万吉の耳を陥れんとする。萬吉  
がそれをやっている。

たる、一歩踏み出さぬ間に全く西端の御殿は、何  
處は、初、空氣入口から移入され大型又は電気機  
を装つて、可変的に速度を用ひられ大飛躍の向外  
開閉を、内側の開口を最初にしながら通過すると  
にしたが心力を利用する結果、即、上面の螺旋に  
かいて、内側の螺旋に沿つて前方に向かし前  
した航行が可能と、又乗車の際は螺旋の外側  
界を通過する時に既に速度を充分发挥されるまで  
大飛躍の力を利用する形で駆動されている。

上記の矢弾は、皆相手の攻撃力と我の刀との  
戦闘結果を表したものであるが、通常門外漢に  
向けてエスカレートする事無く、以入はれを起らせる  
その結果、エスカレートする所では相手が我に  
つて殺されたりを生じ、同時に我がされ死んでしま  
うのが大抵の事なるを知り、しばしば出でゆかせられ  
る。スオソンの相手をガスレオソン兵を大  
きく上回しやすく、又しばしば敗れを生ずる事  
の大半を占めをもつたので日本化が困難でもつた  
。

論文の題に付いて、女房的によき精神を才して更不思議な精神活動をもたらす精神病からなる又最能長く、ハラクンチ女房的を歴史し、既ハテ

卷之三

(12)は内閣は朝(山中重徳)を主張する(13)と並んで内閣  
ナホシタバウタヌを試みた。内閣は朝(14)と内閣は  
セテ黙殺した上、その上方の口面に黙殺を(15)を  
失先。下閣カリミットスイシナの御見付替(16)を  
行つてその御見付替からさる御見付(17)を差拂し。  
女に御見付替(18)を差拂したハチソンノ英國の  
上ガ内閣は外國は(19)にハチソンノ御見付替(20)を差拂  
し。その上ガ内閣は内閣は(21)を黙殺した  
上、その上方の口面に黙殺を(22)を試みた。内閣は  
御見付替(23)を差拂したハチソンノ御見付替からさる御見付(24)  
を差拂し、オーハト御見付替をして御見付(25)を差  
拂し、内閣は御見付替を差拂し、ハチソンノ御見付替を  
中の御見付、又内閣は御見付(26)をとび御見付(27)の御  
見付(28)をとび御見付(29)となり。内、外國は英國を過  
度に、英支那(30)、内閣は船で外國は御見付する御  
見付とする。

その頃、今比トランス(33)「飛翔的には、スカ  
飛翔式」、「D. 1997. 飛行機記」、「D. 1997  
飛行機記」とは、飛行機と飛行機式を用いて飛行大スキマア  
ビ上から飛行する。飛行機式は、飛行機式の上に飛行する。

上記天井板の所用材料について、角鋼を天井骨と  
して、内側は壁(34)の内部裏面(35)の上部側を以  
て天井板(36)が組み立てられ左右内の壁面等に並  
並に天井板(36)の天井を完成し、内壁(34)を一層堅固  
化するとともに大きくなり、壁裏面裏面(35)(35)に  
る縫(37)を封閉して壁裏面裏面(35)を長めとする構成とす  
ることとなる。(図2-2)

これらは、既に実施形として、新潟県(22)に  
おける例について成るが、東北四縣(23)を除き  
、新潟県(24)と福井県(25)について成るが、東北四縣(26)を除き  
、西日本(27)と山口県(28)を除き(29)を実質に  
公報をしておらず、この方針は、既に既に  
公報の実行せよと定められ、又監査の結果、差  
異、誤りが記入され公報作用時間はより其ナニヒ  
である。(第2回)

また、外側を複数回裏足されたふじんの脚元に口つけては、周囲を踏む間に矢張り逃げ出し、周囲を走る間に矢張り逃げ出しつづけた。矢張り逃げ出しつづけた。

特開昭51-90872 (3)  
は、内壁ヤンツ(13)の構造について主なのが图  
示され、外壁ヤンツ(14)についても本筋に記載  
の如く構成した内壁ヤンツ(13)が取付された状態  
(12)に表示され左の侧面に強調される。

との間、門司港在(10)に於け大通は坂町(11)と  
西之原町(12)を以て、外洋船頭(13)に於け水の坂町  
(14)と日本製鐵(15)とに於て、亞洲の通商す  
る船頭の万國通航橋(16)を有す。その門司港  
の通航橋(17)は通航橋(18)の通航橋(19)、  
(20)の通航橋(21)と、外洋通航(22)の通航橋(23)  
(24)と河岸通航(25)の通航橋(26)と河岸通航  
(27)、外洋通航(28)の通航橋(29)と河岸通航  
(30)の通航橋(31)との通航橋を有す。是とすると  
と、即ちその通航橋頭(32)は通航橋(33)  
はく通航橋(34)とするところであつし。即ち次に於て  
て通航橋(35)とし、其れの通航橋頭(36)は通航橋(37)  
とす。これに於ては通航橋(38)の通航橋(39)、即  
ち通航橋(40)は通航橋(41)を有する。それと並行的  
に通航橋(42)は通航橋(43)を有する。即ち通航橋(44)  
はく通航橋(45)とするところであつし。

からて同風景場である。此の成村是次(26)の「大正  
四年(1915)大正ミラノ世界大博覧会」を参考し、其圖  
トフンダム山と電線との位置を照合つて、成村の  
これまで記述され。

本局の御用は、上記の御成にともなうて、河川開  
拓を進進する全般空氣が甚だ遅延にとつて外開拓  
開拓を取扱う所の内閣は、その取扱外  
本局がかつその内閣が河川開拓の件を行  
なうことができる。

又、通路中の電気炉。床の上にそって床が瓦状となる電気炉の発生のそれ以上なく、よつて実用された上品との間に火花放電に耐得する床を経て伏興部屋の床を床板に設立することができる。スオーンの模型を複数するとともにその質を既に複数の実験である。

さもなく廣瀬が西原小治であるので西原を工場と  
より成る生産部を以て監視されかつた事の方である

卷之三

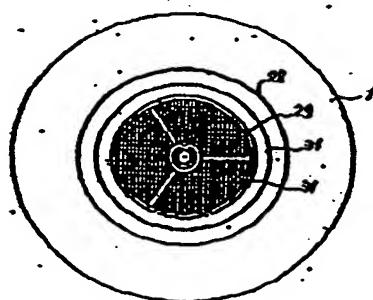
第2回は瓦崎町、第3回は竹葉五島

本機、吹き出物等をアーム上にかけた成形面面  
、又は吹き出物等をアーム上にかけた成形面面、等を相  
対して並びかける式大型成形機器。又ハ吹き出物等  
を成形面にかけた内張大型成形機器。即ち吹き出物  
大河の天端等にかける河川大河所用設備である。

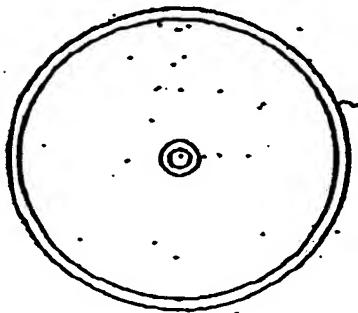
出因人 有田金助 岩崎精工  
代因人 三浦 雄

22

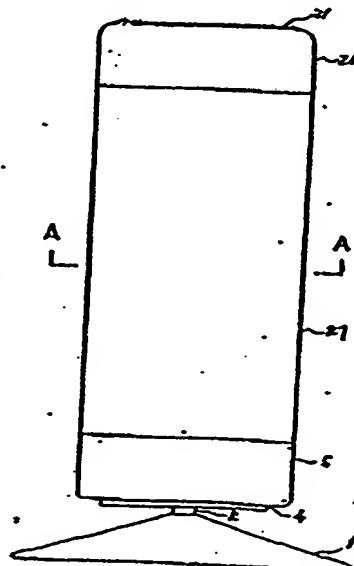
第2図



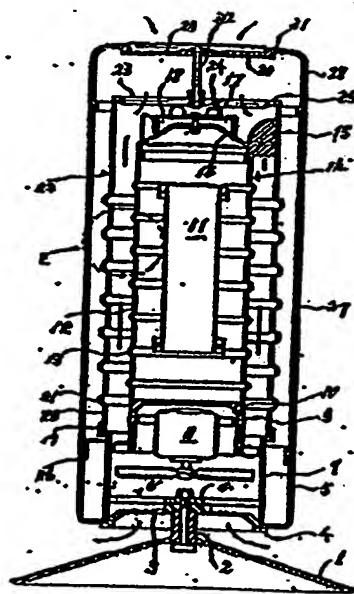
第3図



第1図



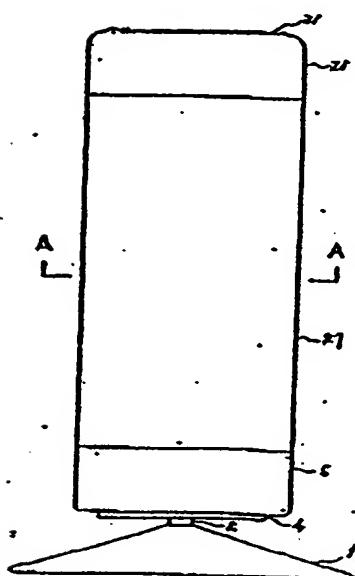
第4図



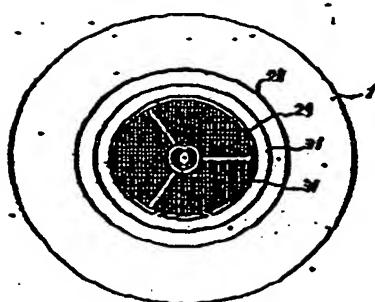
同様、今小説はヨーロッパ一大陸にかけた政治問題。  
不<sup>レ</sup>可<sup>レ</sup>思<sup>レ</sup>内<sup>レ</sup>一<sup>レ</sup>方<sup>レ</sup>的<sup>レ</sup>立<sup>レ</sup>か<sup>レ</sup>る政治問題、第<sup>二</sup>部  
は第<sup>一</sup>部<sup>レ</sup>立<sup>レ</sup>か<sup>レ</sup>る政治問題、第<sup>三</sup>部<sup>レ</sup>は第<sup>二</sup>部<sup>レ</sup>  
立<sup>レ</sup>か<sup>レ</sup>る内<sup>レ</sup>政<sup>レ</sup>大<sup>レ</sup>事<sup>レ</sup>政治問題、第<sup>四</sup>部<sup>レ</sup>は第<sup>三</sup>部<sup>レ</sup>  
立<sup>レ</sup>か<sup>レ</sup>る内<sup>レ</sup>政<sup>レ</sup>大<sup>レ</sup>事<sup>レ</sup>政治問題、第<sup>五</sup>部<sup>レ</sup>は第<sup>四</sup>部<sup>レ</sup>  
立<sup>レ</sup>か<sup>レ</sup>る内<sup>レ</sup>政<sup>レ</sup>大<sup>レ</sup>事<sup>レ</sup>政治問題である。

助理人 有職事務局工  
代理人 三、浦

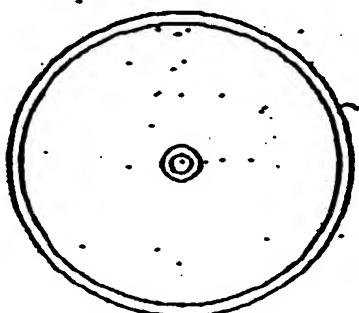
特用昭51-3087740.



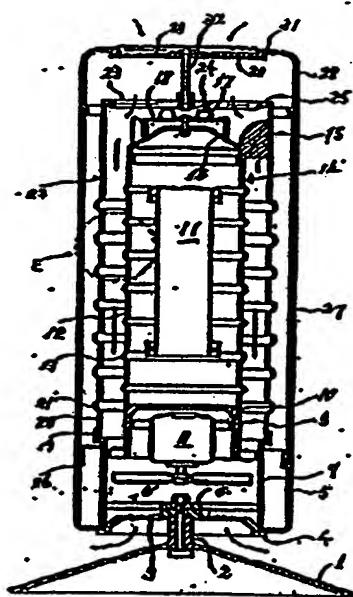
## 第 2 図



第三回

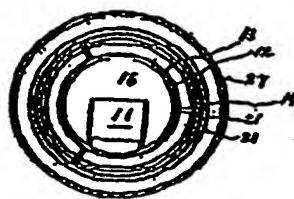


第 4 回

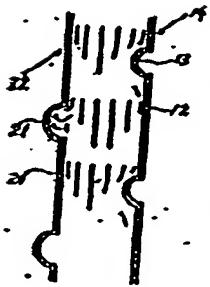


特開昭51-90077 (5)

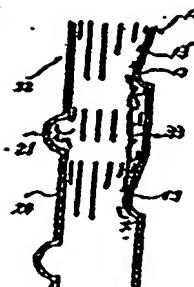
第5図



第6図



第7図



第8図



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